

Title: Paper, Paper Everywhere!

Brief Overview:

This unit involves collecting, organizing, and displaying data. Students use the data collected to analyze a real-life problem, identify possible solutions, and formulate a plan of action. This unit involves the collection of classroom trash and paper and designing a plan to conserve paper.

Link to Outcomes:

- **Problem Solving** Students will demonstrate their ability to solve problems in a cooperative atmosphere.
- **Communication** Students will demonstrate their ability to communicate mathematically. They will read, write, and discuss mathematics.
- **Reasoning** Students will demonstrate their ability to reason mathematically. They will gather evidence and build arguments.
- **Connections** Students will demonstrate their ability to connect mathematics topics within the discipline and with other disciplines.
- **Number Sense** Students will demonstrate their ability to estimate and determine reasonableness of answers.
- **Statistics** Students will demonstrate their ability to collect, organize, and display data and will interpret information obtained from displays. Write a plan based on statistical information collected.

Grade/Level:

Grades 3-4

Duration/Length:

This unit takes approximately 10 days to complete (four class sessions and six days of data collecting).

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- frequency tables
- pictographs
- bar graphs
- estimation

Objectives:

Students will:

- work cooperatively with partners and in groups.
- collect, organize, and display data.
- identify possible solutions for a real life problem.
- evaluate the solutions' effectiveness.

Materials/Resources/Printed Materials:

- "Sarah Cynthia Sylvia Stout Would Not Take the Garbage Out" from Where the Sidewalk Ends by Shel Silverstein
- Student Resource 1 and 2
- Student Resource 3 (Writing Prompt)
- Teacher Resource 1 (Rubric)
- Chart Paper
- Trash bags (one per group)

Development/Procedures:

Day 1:

- Teacher will read the poem "Sarah Cynthia Sylvia Stout Would Not Take the Garbage Out" by Shel Silverstein.
- Discuss types of trash that can be found in a classroom.
- Tell students they are going to collect data about the classroom trash.
- Students work in groups of 3-4 to predict the type and estimate the amount of trash they think will be collected. Share predictions and estimates with the class.
- Groups will collect their trash and put it in their group bag for 2-3 days. (Suggestion: Do not collect food, used tissues, or pencil shavings.)
 - Label bags with group name and place them in an accessible location.
 - Inform students that when they need to throw away any trash to put it in their group bag.
 - All classroom trash is to be collected for 2 to 3 days.

Days 2, 3 and 4:

- Collect trash.

Day 5:

- Each group makes a frequency table of the type of trash found in their group bag and then displays the data using a bar graph. Class should generate a scoring tool for the bar graph.
- Each group shares their results with the class.

- Brainstorm ways to reduce and/or reuse classroom trash. Teacher lists ideas on chart paper.
- Teacher explains that since paper makes up a large portion of the classroom trash, we will now focus on classroom paper only.
- Students work in cooperative groups to list ways they use paper during a school day.
- Tell students they are going to collect data on how much paper they use each day for 2-3 days. Each student will estimate how much paper they will use and records their estimate on Student Resource 1.

Days 6, 7 and 8: (Collect data on paper usage)

- Students complete Student Resource 1 during the school day.
- At the end of the day, students count their tallies, record the number, and estimate the next day's usage.

Day 9:

- Each student graphs their own frequency table results using a pictograph. The class should generate a scoring tool for the pictograph.
- Complete Student Resource 2 with a partner.

Performance Assessment: (Day 10)

Students complete the writing to inform prompt on Student Resource 3. The scoring rubric is found on Teacher Resource 1.

Extension/Follow Up:

- Share paper conservation posters with other classes.
- After 2-3 weeks, repeat the classroom paper activity and compare the results with the first set of data. Evaluate the effectiveness of the plan.

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Name _____

Pieces of Paper Used Each Day

DATE	SUBJECT	ESTIMATE	TALLY MARKS	TOTAL COUNT
	Language Arts			
	Math			
	Science			
	Social Studies			
	Language Arts			
	Math			
	Science			
	Social Studies			
	Language Arts			
	Math			
	Science			
	Social Studies			

Describe any patterns or trends you notice.

Name _____

Interpreting a Pictograph

Directions: Exchange this paper and your pictograph with a partner. Then answer questions 1 and 2 about your partner's data.

Partner's Name _____

1. What information does the pictograph show?

2. Write 2 questions about this pictograph.

a. _____

b. _____

3. Return this paper and the pictograph to your partner.

4. Answer your partner's questions on the lines below.

a. _____

b. _____

5. What did you learn from doing this project?

Writing to Inform Prompt

Since you have just finished collecting data on how much paper you use during a school day, you realize that it is necessary to conserve classroom paper. Design a plan to explain to other students ways paper can be conserved in a classroom. Include a poster to advertise your plan.

Before you begin to write, think about ways you can reuse paper, ways you can reduce the amount of paper you use each day, and reasons why your plan would work.

Now write a paragraph to explain to other students your plan to conserve paper. Your plan should include at least three ways to conserve paper and three reasons why you think your plan will work. Be sure to include a poster to advertise your plan.

Rubric for Writing to Inform Prompt

4 Points

- Gives at least 3 ways to conserve paper.
- Gives at least 3 reasons why the plan will work.
- Has a topic sentence that addresses the main idea.
- Has a concluding sentence.
- Uses correct form.
- Addresses the audience.
- Is well organized.
- Has a poster that completely advertises your plan.

3 Points

- Gives 2 ways to conserve paper.
- Gives 2 reasons why the plan will work.
- Has a topic sentence.
- Has a concluding sentence.
- Uses correct form.
- Addresses the audience.
- Has good organization.
- Has a poster that adequately advertises your plan.

2 Points

- Gives 1 way to conserve paper.
- Gives 1 reason why the plan will work.
- Has a topic or concluding sentence.
- Is somewhat organized.
- Has a poster that somewhat advertises your plan.

1 Point

- Is off topic.
- Has no evidence of organization.
- Has a poster that is off-topic.

0 Points

- No response is given.
- Has no poster at all.